

What is claimed:

1. A composite comprising a metallic substrate and a crystalline ceramic material on said substrate, said ceramic material having crystalline anisotropy with a plurality of oxide blocks, each said block separated by an interlayer plane of at least one of an alkali, alkaline earth and rare earth ions.
2. The composite of claim 1 wherein said ceramic material has a crystalline structure selected from the group consisting of layered perovskite structures and layered spinel structures.
3. The composite of claim 2 wherein said ceramic material is a titanate perovskite having a compositional formula $AB_{n-1}Ti_nO_{3n+1}$.
4. The composite of claim 3 wherein said ceramic material is $BaNd_2Ti_3O_{10}$.
5. The composite of claim 2 wherein said ceramic material is a niobate perovskite having a compositional formula $AB_{n-1}Nb_nO_{3n+1}$.
6. The composite of claim 5 wherein said ceramic material is $KCa_2Nb_3O_{10}$.
7. The composite of claim 1 wherein said metallic substrate is selected from the group consisting of nickel, chromium, steel, yttrium and alloys thereof.
8. A composite comprising a metallic substrate and a crystalline ceramic material on said substrate, said ceramic material having a perovskite crystalline structure and a composition selected from the group consisting of titanate and niobate perovskites.
9. The composite of claim 8 wherein said ceramic material is $BaNd_2Ti_3O_{10}$.
10. The composite of claim 8 wherein said metallic substrate is selected from the group consisting of nickel, chromium, steel, yttrium and alloys thereof.
11. The composite of claim 8 further including a bondcoat between said metallic substrate and said ceramic material.

12. A method of using temperature effect on a crystalline ceramic material to reduce the thermal conductivity of said crystalline ceramic material, said method comprising:

providing a ceramic material, said ceramic material having a layered crystalline morphology and orientation; and

heating said ceramic material at a temperature sufficient to alter said crystalline orientation of said crystalline material.

13. The method of claim 12 wherein said ceramic material is $\text{BaNd}_2\text{Ti}_3\text{O}_{10}$.

14. The method of claim 12 wherein said ceramic material is annealed.

15. The method of claim 12 wherein said ceramic material is plasma sprayed.

16. A method of using the texture of a ceramic material to affect thermal conductivity of the ceramic material, said method of comprising:

providing an anisotropic crystalline ceramic material, said crystalline material comprising a plurality of layered basal planes, said material having a first crystallographic texture; and

treating said ceramic material to provide a second crystallographic texture.

17. The method of claim 16 wherein said ceramic material is $\text{KCa}_2\text{Nb}_3\text{O}_{10}$.

18. The method of claim 16 wherein said ceramic material is thermally stressed.

19. The method of claim 18 wherein said ceramic material is annealed to induce said second crystallographic texture.